

Remote Sensing and Sustainable Development in the Mining Sector

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ABSTRACT

The objective of this communication is to show the possibilities offered by spatial remote sensing (Remote Sensing) in the sustainable management of resources (soil, water, land, vegetation, mines, etc.). Developers and managers of economic development, the environment and the living environment most often only have information partial or very localized on natural resources. To overcome this deficiency, it is advisable to resort to a more global and better structured information system, such as to allow diversified uses according to needs. In this regard, the contribution of multispectral remote sensing is essential because of the repetitiveness of satellite observations, the synoptic view of the sensors and their spatial resolutions. The old methods of study and data collection are expensive and tedious and often involve huge errors, especially for areas that are difficult to access. Open-pit mining operations for bauxite or any other mineral generate profound changes in the natural environment that must be monitored diachronically in order to provide active responses to restore the ecosystem balance. The characteristics of the images provided by high resolution and large instantaneous view sensors such as those of Landsat TM, MSS and SPOT HRV are very much appreciated in this context. The images provided by the sensors in panchromatic mode (black and white) or in colored composition FFC (false Color Composite) often make it possible to characterize the objects from their spectral responses thanks to the electromagnetic radiation reflected according to the spectral bands of observation. Certainly, difficulties may remain in the separation of certain objects for visual interpretation, but these can be compensated for by image processing and classification methods that make it possible to obtain real information, in order to better characterize the objects. Indeed, each object of nature or unit of occupation of the environment consists of a number of pixels, and better, according to the reflected electromagnetic radiation, which is a function of the temperature, the spectral reflectance curves are elements of differentiation according to the observation wavelengths of the electromagnetic spectrum (the visible, the infrared "IR" including the near infrared, the medium infrared and the thermal infrared), the microwaves or the microwaves. Spatial remote sensing makes it possible to collect images from high resolution sensors such as those of SPOT and Landsat TM (Thematic Mapper) and MSS (Multispectral Scanner) which are very popular for mapping. In particular, the colored composition of the 3 SPOT channels is a good document for medium and large-scale interpretation and mapping.

Keywords: Remote sensing, Sustainable development, Mining sector

